

# DESTRUCTIVE METHODS OF FISHING IN THE RIVERS OF THE HILL RANGES OF TRAVANCORE.

BY

S. JONES, M.SC.

*“Lo! a child is born in the fisherman’s house!  
Lo! the newly born fellow carries a net on his head!  
Dhar, dhar, weeps the Singni fish, my love!  
My life-long enemy is born today!  
Alas, alas, O alas!  
My life-long enemy is born today!”*

(The Gond’s song of the Singni fish by Devendra Satyarthi)

## INTRODUCTION

Much has been said since the middle of the last century deprecating the destructive methods of fishing in the freshwater tracts of India. Exposed as Travancore is to both the monsoons, the rivers of the State contain water throughout the year, though they are small and most of them little larger than torrential streams compared to large rivers on the East Coast and of North India. In these rivers, which once contained an abundance of fish, it is hardly possible now to see a good sized specimen in the low-country due to over-fishing and the same is true of the mid-country or the semi-hilly tracts. The up-country consisting of the mountainous districts withstood the encroachment of Man for some time, but since the opening up of a fairly extensive area for plantations, such as tea, rubber and cardamom, there is hardly any area in the State which is not within easy access of Man. Before this the original inhabitants of the jungles, like the hill men of the *Mannan*, *Paliyan*, *Oorali*, *Muthuvan* and *Kanikkar* tribes, used to live close to the rivers and streams and fishing also had been one of their vocations in life for their daily sustenance. In those ancient days there was none to dispute their right in the extensive ‘jungle areas with plenty of wild game and forest produce’. Since large scale clearing of jungles began they have been pushed back to the least fertile of the tracts, their movements have been restricted, the wild game has been reduced considerably and the needs of life have increased. This state of absolute poverty together with their inherent laziness compels them to resort to every means, foul or fair, in their struggle for existence. The net result of all these in their fishing vocation is the extensive use of poisons wherever and whenever possible for capturing fish. According to the story narrated by the head of a *Mannan* colony near the Tual waterfall in Vandanmettu-Kallar River in Peermade, it was one of their forefathers, a king of the jungles, hundreds or thousands of years ago that introduced the fish from the lower side of the waterfall to the upper side; and therefore as protectors of the fish they are not allowed by ancient tradition to capture it by poisoning. But all such scruples have yielded to the insistent demands of life nowadays and poisoning

of fish for easy capture has become one of their routine activities during the hot months.

The southern region of the Western Ghats consists of the mountainous tracts of Travancore which cover nearly half the State's total area of 7,625 sq. miles. From north to south the hill range is nearly 200 miles long and several rivers arise from here and flow towards the west into the Arabian Sea. The northern region is more extensive, its elevation is greater and the rainfall is heavier, and for these reasons all the large rivers are confined to this area. There are two artificial lakes in the mountains, the Periyar Lake in the north and the Kothayar Lake in the south.

#### TYPES OF FISH AVAILABLE IN THE STREAMS AND RIVERS OF THE HILL RANGES OF TRAVANCORE.

The study of the fish fauna in this region is far from complete. Only very recently some new and interesting species such as *Travancoria jonesi* Hora (1941), *Lepidopygopsis typus* Raj (1941), *Batasio travancoria* Hora & Law (1941), *Barbus (Puntius) ophicephalus* Raj (1941 a) and *Barbus (puntiis) micropogon* subsp. *periyarensis* Raj (1941 a) have been added to the list and the distribution of several others has been extended to Travancore (Hora & Law, 1941 & 1941 a and Hora & Nair, 1941). For a complete list of the fresh water fish of Travancore including those represented in the hill ranges, the works of Pillay (1929), John (1936) and Hora & Law (1941 a) may be consulted in addition to the references mentioned above. Mention may also be made of an exotic fish, the Rainbow Trout<sup>1</sup>, that has become acclimatised in the rivers of the Kannan Devan Hills (Gopinath, 1942).

Among the hill stream fishes in Travancore, the greatest favourite and one of the most delicious is the local Mahseer, *Barbus (Tor) khudree* known as *Kuyil* in Tamil. The larger among the rest, like *Rasbora daniconius*, *Barilius gatensis*, *Danio aequipinnatus*, *Garra mullya*, etc. are eaten by the middle class people when fish is scarce. The coolies and hill men eat any fish they get without much discrimination.

Dr. Hora has given a comprehensive account of *B. khudree* in his game fish series in the Journal of the Bombay Natural History Society (Hora, 1942). This is perhaps the largest fish in the hill streams and rivers in Travancore and according to Hora it is the commonest species of these parts and its range extends along the Satpura trend to the Central Provinces (Hora & Law, 1941 a). I have seen fish up to 22 inches in length caught from Vandannettu-Kallar River and I am informed that fish up to three feet are not uncommon. I have known from very reliable sources that fish weighing about 30 lb. have been taken from the river about 12 years ago. Unfortunately since the use of dynamite for easy

<sup>1</sup> The wandering instincts of the Ceylon and Travancore Trout and its vertebral and scale counts show that it is not a true Rainbow but a hybrid between a Rainbow and a Steelhead. For details see Phillip Fowke, *Cey. Journ. Sci.*, v, 1938; pp. 178 & Mackay, W.S.S., *J., B.N.H.S.*, xlv, 1945; pp. 352-373 & 542-557.

fishing in hilly tracts has become very common large Mahseers are extremely rare. In this respect perhaps the Vandanmettu-Kallar and the tributaries of the Periyar south of Kumili are some of the few rivers that have not been greatly affected so far. Though fishing is prohibited in almost all the rivers and streams in the hills, it would be better if such of those rivers as still remain safe and important breeding grounds for the Mahseer are rigorously protected by special legislation and by the appointment of additional watchmen during the summer months. Along with this it is necessary that the proper kind of fishing like angling should be encouraged.

*B. khudree* is a clever fish and successful catches can be made with only proper baits. It is the elusive nature of the fish that obliges the local people to abandon the proper methods and resort to other more sure but destructive methods of catching it. It is necessary that the habits of the fish should be studied thoroughly to achieve the maximum success with the rod and line and a more sporting tendency should be developed among the people. In the Periyar Lake and within the Peermade Game Reserve, *B. khudree* is caught with rod and line. Both in the lake and in its head waters fish up to 20 lb are generally caught with spoon or plug bait and on fly. The Annual Reports of the Peermade Game Association may be referred to for further details.

A closed season should be fixed for this fish after a careful study of its breeding habits (Jones, 1946). The capture of fish during migration for breeding (Jones, 1941) should also be stopped. The general practice of setting fire to the grasslands is to be strongly deprecated as this not only destroys to some extent the insect life close to the banks but also contributes to the filling up of the pools in the course of the stream with silt and mud due to soil erosion. There is no doubt that with more rigorous legislation and mass education the destructive tendencies would be considerably eliminated. In certain pools close to the temples, as at Ayyappancoil and Vandiperiyar in the course of the Periyar River, large sized specimens of *B. khudree* are much less shy of man; they come close to the edge of the water and feed on the offerings given.

#### DESTRUCTIVE METHODS OF FISHING.

While dealing with the freshwater fish and fisheries of Travancore, John (1936) described some of the destructive methods of fishing, especially those employed in the plains. Some of the methods followed in the up-country, such as the use of copper sulphate, jatropha seeds, fixed engines and tripod net were also noted by him.

The methods of fishing in different parts of South India are similar in principle with some modifications according to the local conditions and ingenuities of the people. The employment of such 'exotic' materials as dynamites and chemical poisons would depend on their availability. Thomas (1870) in his report on pisciculture in South Canara and Wilson (1907) in his reports on the methods of capture and supply of fish in the rivers of Nilgiri District list the destructive methods of fishing practised in those tracts.

Thomas (1870) refers to the poisoning of fish in the rivers with *Croton tiglium*, *Anamirta cocculus*, *Capsicum frutescens* and a species of *Posoqueria* known as 'Káre Kai' in Tulu. He is also of opinion that the residue from the coffee pulpers erected in the course of rivers may have a detrimental effect on the fish-fauna of the locality. Among the fixed engines different kinds of basket traps placed in small channels and in the middle of artificial dams and obstructions constructed across the river for the capture of fish going up as well as coming down the river are mentioned. He suggests that watchmen should be appointed to prevent poisoning and construction of fish wiers. The basket traps should according to him have wide spaces to allow all under sized fish to escape. He is against advocating a closed season since he is of opinion that in many fishes breeding period is very extended and in the case of those spawning at the commencement of the monsoon rains due to the floods prevalent then a natural closed season is imposed.

Wilson (1907) speaks of the fishing in Bhavani, Moyar and in some small streams near Ootacamund. Here the chief methods are the use of fixed engines consisting of basket traps, some of them so small meshed as to be known as fry traps, poisoning with berries and dynamiting. He refers to the use of cradle trap which is a modified basket trap in some parts of the Moyar River when the level of water is not very low. His main suggestions for the improvement of the fisheries are appointment of watchmen to prevent dynamiting, poisoning and other illegal methods of catching fish, legislatoin against the use of fixed engine, regulation of the mesh of cast nets and introduction of new varieties of fish into suitable streams.

The list of destructive methods for the hill ranges of Travancore given in this article is by no means complete. It has been mainly compiled from the information received and as a result of enquiry made during the writer's stay in the Cardamom Hills. In some of these up-country regions, settlers from other parts have introduced their own methods of fishing, so that a clear demarcation of the methods peculiar to different regions is hardly possible. Destructive methods of fishing in the hilly tracts of Travancore come under the following main categories, viz. use of explosives, poisons (chemical and vegetable), traps and nets.

#### EXPLOSIVES.

*Dynamite* (Thotta, M. & T.<sup>1</sup>): This is perhaps the most fashionable and at the same time one of the most destructive of all methods employed for catching fish in the hills. Due to the opening up of several roads, dynamite, which is necessary for blasting stones has become easily available though some difficulty is experienced now due to the war. To have the maximum effect in the use of a dynamite the bed of the pool should be rocky or sandy and the time adjustment of the explosion should be such that it would take place at the correct depth. The fish come up due to the shock

<sup>1</sup> M = Malayalam. T = Tamil.

and those that die sink down immediately. The destruction is so thorough that hardly any fish, large or small, within a radius of about 5 to 10 yards survives. Those at a distance are partially affected and remain in a dazed condition facilitating easy capture. The small sized fish is ignored and the larger ones, which form only a fraction of the total kill, are caught by people who jump into the water immediately after the explosion with their bodies rubbed with oil and ears plugged with cotton wool, if the water is very cold. In large pools where a good catch is expected sometimes two dynamites are used simultaneously to produce double effect!

*Crude explosives (Kettu-thotta, M. & T.):*—Country made explosives are made in old types of soda water bottles and in unopened cocoanut shells. In the case of the former type the explosion is said to be tremendous and the destructive power very great.

### POISONS.

*Copper sulphate (Thurisu, M. & T.):*—This stuff as one of the components for the preparation of the Bordeaux mixture, commonly used for spraying diseased plants, is available in the estates and the employees who have access to it during the spraying season save small quantities of it without the knowledge of the estate authorities. Usually a suitable pool in a stream, where a good number of fish are suspected to be present, is selected and heavy flow of water if any, is diverted and powdered copper sulphate is put in a cloth and is dissolved at the head end. The gentle flow of water diffuses the copper sulphate and the fish come up to the surface of the water in a stupified and lethargic state when they are caught. Both large and small sized fish, including the Mahseer, are affected and it may not be unusual to see small dead fish flowing along the course of the stream. This method and the one described below are employed extensively in the rubber plantations.

*Bordeaux mixture (Bodo-marunnu, M. & Bodo-marunthu, T.):*—At the time of spraying of the rubber trees the hose is directed to a pool if there are any streams nearby and any fish that comes up is then caught. This is usually done by the Conductor or Kangany who is in charge of the spraying operations. Any excess of the mixture that becomes available after a day's spraying is sometimes utilised for the purpose of catching fish.

*Lime (Kummayam, M. & T.):*—Large quantities of unslaked lime, if stirred in pools, would force the fish to come up in a dazed condition, when they are caught. This method is not employed extensively in the interior because large quantities of the stuff are not easily available due to the heavy cost of transport.

*Cyanogas or Calcium cyanide (Plague marunthu, T.):*—I am informed from very reliable sources of instances of fishing by the employment of this deadly poison by people who have had access to this fumigant<sup>1</sup>. Though this method is gradually becoming popular in certain areas in recent years it is practised at present only seldom due to difficulty in procuring the stuff. The poison

<sup>1</sup> This is usually available with persons in charge of antiplague measures.

is said to be very effective and a fairly large quantity of the fish is caught by stirring a small quantity of it in pools after diverting or damming the inflowing water. It is necessary that very rigorous action should be taken against those who commit this offence, all the more because it is the educated who are responsible for this.

*Gelignite and dhal mixture*:—The brown paste like gelatine dynamite is mixed with well ground dhal and is thrown in small pellets which are eagerly devoured by the fish. The action is instantaneous and the poisoned fish makes a few rapid spinning movements and sinks down dead. Only very little fishing is carried on in this manner since the gelignite could be more advantageously used as an explosive than as a poison!

*Pā-eecha*, M. (*Acacia pennata* Willd.):—This is a large climber found abundantly in the hills and is known as *Kareencha* in South Travancore. The stem of this plant is cut into small pieces, crushed and thrown into the water which is then stirred. The action is fairly quick and all the fish both large and small come up senseless or dead. This is the commonest poison used by the hill-men throughout the State. Small streams and pools are best suited for the purpose. I recently saw a stream which was once full of small fishes of all types including the young of the Mahseer, without a vestige of fish-life a few days after the hill-men had conducted this utterly indefensible mode of fishing.

*Mullakuru*, M.; *Penkottei*, T.:—Seeds of the twiner, *Anamirta cocculus* W. & A. are crushed and ground well with dhal or rice and used with deadly effect for catching fish. This is said to be the most virulent of all plant poisons for fish. As they are not available in the interior of the jungles the method is usually employed by people at the foot of the High Ranges and in the semi-hilly tracts.

*Nanchumaram*, M. & T. (*Croton Kloteschianus* Thw.):—The leaves of this tree known as 'vakanathukozha' or 'roche' among the hill-men are crushed and used for catching fish in the pools in the course of streams. The crushed leaf is put in the water and stirred well and the fish that come up are caught by people who jump into the water for the purpose. The effect is said to be greater than that of *pā-eecha*. According to the custom of the hill-men, who mostly employ this method, those who go for fishing should avoid using tamarind in their food on the previous day and should spend the previous day and night away from their women folk in which case only they believe they would meet with success. Honey is also forbidden among some during this period. They do not permit other people, if they are suspected to be unclean, to touch the water they are fishing in.

*Kutappanakuru*, M.; Seeds of *Corypha umbraculifera* Linn.:—Unripe seeds of the sago palm or the talipot palm are crushed and stirred in the water for catching fish in the mid-country and on the western slopes of the hills. This method cannot however be employed continuously and extensively as this plant flowers only once in its life when it is usually cut down for the pith which is eaten.

*Veli-avanakku* or *Nanchanpathal*, M.; *Jatropha curcas* Linn.:—

Seeds of this hedge plant are crushed and stirred in pools and the fish that come up are caught. It is a very common plant in the plains from where the seeds are brought to the hills for the poisoning of fish.

*Poothakarandavalli*, M.; *Derris brevipes* Baker:—The tender leaves and flowers of this plant are used as fish poison. The plant is not quite common in the up-country and hence not very extensively used there.

*Neervalam*, M. & T.; *Croton tiglium* Linn.:—Seeds of this are ground well with dhal and earthworms and are thrown as small pellets into the water; and any fish that eats this would immediately come up. The fish caught in this manner is said to cause sometimes giddiness and vomiting when cooked and eaten.

*Pencolum*, M. & T.; *Sapium indicum* Willd.:—The seeds of this tree are crushed well and stirred in pools containing fish and all the fish that come up are caught. This stuff is usually brought by people from the low-country where it is available during certain seasons.

*Thirukalli*, M.; *Kalli*, T.; *Euphorbia tirukalli* Willd.:—In some of the hilly tracts of South Travancore this plant is crushed well and stirred in pools and small collections of water for catching fish. The milky sap of the plant is said to cause irritation to the eyes of the fish and make them partially blind.

#### TRAPS AND NETS.

*Fixed engines*; *Koodu*, M.:—This method is practically a monopoly of the hill tribes except in the lower side of the western slopes. Throughout the course of the streams it is not unusual to see low crude dams constructed with the help of stones, leaves and reeds from one bank to the other so that water would flow out only through the crevices. One or two places towards the middle are kept open where large basket traps are kept with their open ends facing the lower side of the streams so that all the fish including fairly large ones that ascend the streams and rivers are trapped. These traps are kept for long periods in one place, except during periods of heavy floods, and the trapped fish are collected regularly. The catches are heavy during the breeding season.

*Cast nets*; *Veechuvala*, M.:—These are brought by people of the lower regions owning estates in the hills and are not used extensively except in the Periyar Lake though it is strictly prohibited there also. The meshes of the nets are usually very small and therefore young fry and immature fish are also caught. These are said to be used with great effect during the breeding season when fishes migrate up the streams and rivers disregarding all obstacles. The nets are used to facilitate the capture of the fish that come up in a dazed condition after poisoning.

*Tripod net*; *Mukkalivala*, M.:—The contrivance used is figured and described by John (1936). In principle it is after the pattern of the Chinese prawn net. Three poles tied together at the top are erected in pools and a circular net is placed in the middle

Strong cords from the margin of the net are connected to a large central cord which is passed over the poles. Food is thrown in the net and a large number of the fish collect together without suspecting any foul play. The central cord is then suddenly pulled up and all the fish remaining within the net are caught.

*Cloth and blanket collection*:—The coolies and hill-men collect fish with the aid of clothes and blankets during the summer months. Small sized fish in small streams and pools are caught in this manner.

*Chatty-pot collection*:—A wide mouthed earthen pot is taken, some rice is put inside, the mouth is closed by a piece of old cloth with a hole in the middle of it and it is kept immersed in the water. After some time the vessel is gently lifted up, and all the fish found therein are collected. This is repeated a number of times till a sufficient quantity is caught. This method is employed occasionally by coolies and hill-men only who are thus able to catch small sized fish in this manner.

*Hand collection*:—During the summer months when the flow of water is very little, small streams are dammed at intervals and the water is baled out and all the fish present, both large and small, are caught.

*Electric torches and lights*:—This method is very common in the low-country but is also employed in the western slopes of the hills. It is comparatively not so destructive as the previous ones since only the large sized ones among those attracted to the light are killed.

Of the several methods of fishing in the hill ranges mentioned above the use of dynamites, copper sulphate, *mullakuru*, *nanchumaram* leaves, *Pā-eeñcha* and fixed engines are the most common and at the same time the most destructive. Dynamite and copper sulphate are mostly employed by people in the estate areas. *Mullakuru* is used in the semi-hilly tracts and in the western slopes of the hill ranges. It is necessary that the employment of the above three methods should be controlled by more rigorous legislation. *Pā-eeñcha*, *nanchumaram* leaves and fixed engines are employed usually by hill-men and these should be checked with the help of the Forest and Game Departments.

The destructive methods now employed in the hills affect the people resident there in more than one respect. Firstly the fish get so much reduced in number and size that rivers and streams become 'barren' and fishing will be hardly worthwhile in course of time. A rich and nutritious food is thus sure to run out of supply. In malarial tracts this is calculated to bring on serious consequences by devitalising the people and making them easily susceptible to the attack of malaria. To those with a sporting tendency, depletion of the larger fishes deprives them of an interesting game. Most of the small sized carps found in the hill-streams have been found to be efficient mosquito larvivores. During the hot months many of the small streams in cleared areas get converted into stagnant pools wherein mosquitoes breed freely and complete destruction of fish in such situations would tend to aggravate indirectly the malarial problem also.



## ACKNOWLEDGEMENT

I am deeply indebted to Dr. S. L. Hora, Director of Fisheries, Bengal, for going through this paper and communicating it for publication.

## REFERENCES.

- Gopinath, R.—'Acclimatization of Foreign Fish in Travancore'. *Journ. Bombay Nat. Hist. Soc.*, Vol. XLIII, pp. 267-271, (1942).
- Hora, S. L.—'Homolopterid fishes from Peninsular India'. *Rec. Ind. Mus.*, Vol. XLIII, pp. 221-232, (1941).
- Hora, S. L.—'The Game Fishes of India. xv The Mahseers or the large scaled Barbels of India'. *Journ. Bombay Nat. Hist. Soc.*, Vol. XLIII, pp. 163-169, (1942).
- Hora, S. L. and Law, N. C.—'The fresh water fish of Travancore'. *Rec. Ind. Mus.*, Vol. XLIII, pp. 233-256, (1941).
- Hora, S. L. and Nair, K. K.—'New Records of Freshwater fish from Travancore'. *Ibid*, Vol. XLIII, pp. 387-293, (1941).
- John, C. C.—'Fresh Water Fish and Fisheries of Travancore'. *Journ. Bombay Nat. Hist. Soc.*, Vol. XXXVIII, pp. 702-733, (1936).
- Jones, S.—'An interesting case of migration of the stone-licking fish, *Garra mullya* (Sykes), for breeding.' *Curr. Sci.*, Vol. X, pp. 445-446, (1941).
- Jones, S.—'Breeding and development of Indian freshwater and brackishwater fishes'. *Journ. Bomb. Nat. Hist. Soc.* Vol. XLVI, 1946.
- Pillay, R. S. N.—'A list of fishes taken in Travancore'. *Journ. Bombay Nat. Hist. Soc.*, Vol. XXXIII, pp. 347-379, (1929).
- Raj, B. S.—A New Genus of Schizothoracine fishes from Travancore, South India. *Rec. Ind. Mus.* XLIII, p. 209-214 (1941).
- Raj, B. S.—Two New Fishes from Travancore, South India, with remarks on *Barbus (Puntius) micropogon* Cuv. and Val. *Ibid.* XLIII, pp. 375-386, (1941 a).
- Thomas, H. S.—Report on Pisciculture in South Canara. 1870.
- Wilson, H. C.—Reports on the methods of capture and supply of fish in the rivers of the Nilgiri District. Madras, 1907.

'When thou wilt swim in that live bath,  
Each fish, which every channel hath,  
Most amorously to thee will swim,  
Gladder to catch thee, than thou him'.

(By John Donne as quoted in 'The Complete Angler', 1653)

## FIELD OBSERVATIONS ON THE STERCULIAS OF THE BOMBAY PRESIDENCY.

BY

CHARLES McCANN, F.L.S.

(With a plate.)

After a fairly intensive and critical field study of the various species included in the genus *Sterculia* as originally understood (by T. Cooke and others), I have come to the conclusion that there are a number of details in the existing descriptions that need correction, amendment, or explanation. I fully realize that many, if not all, of the original descriptions were based on herbarium specimens, and perhaps on imperfect material at that. On this account many of the characters were either overlooked or misinterpreted.